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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,891	06/27/2003	Raphael Rembrand	12808.20US11	7236
23552	7590	03/16/2006	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			BRINEY III, WALTER F	
			ART UNIT	PAPER NUMBER
			2646	

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 10/607,891	Applicant(s) REMBRAND ET AL.	
	Examiner Walter F. Briney III	Art Unit 2646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| <p>✓ 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>✓ 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date <u>23 September 2003</u>.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input type="checkbox"/> Other: _____.</p> |
|---|---|

DETAILED ACTION

Priority

If applicant desires to claim the benefit of a prior-filed application under 35 U.S.C. 365(c), a specific reference to the prior-filed application in compliance with 37 CFR 1.78(a) must be included in the first sentence(s) of the specification following the title or in an application data sheet. For benefit claims under 35 U.S.C. 120, 121 or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications.

If the instant application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a

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grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required. Applicant is still required to submit the reference in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

Double Patenting

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A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 1-57 of this application conflict with claims 1-57 of Application No. 10/442,495. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Claims 1-57 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-57 of copending Application No. 10/442,495. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1-5, 15, 16, 18, 21-34, 36, 37, 39, 40, 42, 44, 48, 49, 52, 53 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Rembrand et al. WO 02/09473 A2).**

Claim 1 is limited to a “system for enhancing the hearing of certain sounds.” Rembrand et al. discloses a hearing aid including a noise generator for forwarding a natural or synthetic temple noise to a mixer and subsequently to an earphone. See Abstract. Rembrand discloses three apparently distinct embodiments, respectively depicted in figures 1-3. Each figure includes an earphone 6, where the earphone corresponds to the “electro-acoustic transducer” as recited. Each figure further includes a noise generator as disclosed in the abstract. Figure 1 depicts the noise generator as a computer 1 while figures 2 and 3 depict a generator 9 in communication with a pressure indicator 7 by way of cable 8. This noise generator corresponds to the “compensatory signal generator” as recited. In particular, the noise generator produces a temple noise signal to either a mixer 3 or a mixer/amplifier 10. The temple noise signal corresponds to the “compensatory signal” as recited. Rembrand discloses that the noise generator creates the noise signal based on a recorded noise. See page 2, lines 12-34. The recorded noise corresponds to

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the “compensatory waveform” as recited because it is based on “otoacoustic emissions.” Subsequent to mixing, the noise signal generated by the noise generator is forwarded to the earphone. Therefore, Rembrand anticipates all limitations of the claim.

Claim 2 is limited to “the system according to claim 1,” as covered by Rembrand. Rembrand discloses an amplifier 5 that corresponds to the “electro-acoustic amplifier” as recited since it receives the noise signal generated by one of noise generators 1 and 9 and since it transmits the received noise signal to earphone 6. See page 4, lines 12, 18 and 24. Therefore, Rembrand anticipates all limitations of the claim.

Claim 3 is limited to “the system according to claim 1,” as covered by Rembrand. Rembrand discloses that the noise generator comprises a laptop computer in one example. The computer records an AVI, and thus, inherently requires memory for recording. This inherent memory corresponds to the “waveform storage unit” as recited. The laptop’s CPU corresponds to the “processor” as recited and is responsible for recording and reproduction. The Sound Blaster compatible sound card corresponds to the “digital to analog converter” as recited since it provides a signal to amplifier 5. See page 2, lines 12-20. Therefore, Rembrand anticipates all limitations of the claim.

Claim 4 is limited to “the system according to claim 1,” as covered by Rembrand. Rembrand discloses a microphone 2 that corresponds to the “ambient acousto-electric transducer” as recited. Therefore, Rembrand anticipates all limitations of the claim.

Claim 5 is limited to “the system according to claim 4,” as covered by Rembrand. Rembrand discloses amplifiers 5 and 10, which are used in separate embodiments to amplify the mixed microphone signal originating from at least microphone 2. The amplified signal is then supplied to earphone 6. The amplifiers correspond to the “ambient sound amplifier as recited.” Therefore, Rembrand anticipates all limitations of the claim.

Claim 15 is limited to “the system according to claim 1,” as covered by Rembrand. Rembrand discloses recording otoacoustic emissions at the temple and providing this recording to a laptop computer that has been discussed in the preceding claim rejections. See page 2, lines 14-16 and 29-34. This disclosure highlights that the microphone is coupled to the “body” and the computer, i.e. “compensatory signal generator.” The resulting method taken from the structure disclosed by Rembrand includes detecting an otoacoustic emission, transmitting it to a laptop, storing it, forwarding it to one of mixers 3 and 10. Therefore, Rembrand anticipates all limitations of the claim.

Claim 16 is limited to “the system according to claim 15,” as covered by Rembrand. Rembrand discloses measuring “otoacoustic emissions.” See page 2, lines 29-33. Therefore, Rembrand anticipates all limitations of the claim.

Claim 18 is limited to “the system according to claim 1,” as covered by Rembrand. Rembrand discloses recording otoacoustic emissions using a microphone and transferring the recorded emissions to a laptop. See page 2, lines 14-16 and 29-33. The microphone corresponds to the “otoacoustic

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acousto-electric transducer” as recited. The laptop receives the microphone signal, records it as an AVI and uses the resulting AVI to create a noise signal, i.e. “compensatory signal.” In this way, the laptop makes use of both the microphone signal and the resulting AVI to create a noise signal. Therefore, Rembrand anticipates all limitations of the claim.

Claim 21 is limited to “a method for enhancing the hearing of certain sounds.” Apropos the rejection of claim 1 it was shown that Rembrand discloses “producing” a noise signal with one of noise generators 1 and 9. The noise signal corresponds to a “compensatory signal.” The noise signal is based on an AVI of an otoacoustic emission. The AVI corresponds to a “compensatory waveform.” Rembrand was shown to disclose an earphone 6 that creates an acoustic replica of the noise signal in an ear. Therefore, Rembrand anticipates all limitations of the claim.

Claim 22 is limited to “the method according to claim 21,” as covered by Rembrand. Rembrand discloses recording a new noise signal AVI, which corresponds “to modifying at least a portion of said compensatory waveform.” See page 2, lines 12-33. Therefore, Rembrand anticipates all limitations of the claim.

Claim 23 is limited to “the method according to claim 22,” as covered by Rembrand. By recording a new AVI, a general modification parameter is determined, e.g. an updated otoacoustic emission. See page 2, lines 29-33. Therefore, Rembrand anticipates all limitations of the claim.

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Claim 24 is limited to “the method according to claim 22,” as covered by Rembrand. Rembrand discloses monitoring sounds, such as otoacoustic emissions (OAE). OAE corresponds to “ambient sound. The monitoring produces an analog of the OAE; the analog signal is then translated to a digital signal and recorded. The analog corresponds to “ambient sound characteristics. Therefore, Rembrand anticipates all limitations of the claim.

Claim 25 is limited to “the method according to claim 22,” as covered by Rembrand. Apropos the rejection of claim 24, it was shown that OAE are recorded. OAE corresponds to “at least one bodily signal respective of a bodily activity.” Therefore, Rembrand anticipates all limitations of the claim.

Claim 26 is limited to “the method according to claim 25,” as covered by Rembrand. Apropos the rejection of claim 25, it was shown that “otoacoustic emissions” are recorded. Therefore, Rembrand anticipates all limitations.

Claim 27 is limited to “the method according to claim 21,” as covered by Rembrand. Apropos the rejections of claims 24-26, it was shown that Rembrand discloses monitoring “otoacoustic emissions” to determine a “compensatory waveform,” and thus “before performing said procedure of producing said compensatory signal.” Therefore, Rembrand anticipates all limitations of the claim.

Claim 28 is limited to “the method according to claim 21,” as covered by Rembrand. Apropos the rejections of claims 24-26, it was shown that the recorded OAE are recorded, i.e. “stored.” Therefore, Rembrand anticipates all limitations of the claim.

Claim 29 is limited to “the method according to claim 21,” as covered by Rembrand. Otoacoustic emissions are naturally occurring phenomenon and do not limit the method as recited. Despite this, it is inherent that the recorded OAE disclosed by Rembrand will fall into one of these three categories of known OAE. Therefore, Rembrand anticipates all limitations of the claim.

Claim 30 is limited to “the method according to claim 21,” as covered by Rembrand. Rembrand discloses recording these OAE using either microphones or pressure indicators. See page 2. Therefore, Rembrand anticipates all limitations of the claim.

Claim 31 is limited to “the method according to claim 21,” as covered by Rembrand. Rembrand discloses an amplifier 5, which amplifies the noise signal, i.e. “compensatory signal,” produced by either noise generator 1 or 9. Therefore, Rembrand anticipates all limitations of the claim.

Claim 32 is limited to “the method according to claim 21,” as covered by Rembrand. Rembrand discloses a laptop 1 for producing the noise signal that corresponds to the “compensatory signal.” Rembrand also discloses a sound card (not shown) for translating this signal from a digital to an analog signal to be fed to the remaining hearing aid datapath. See page 2, lines 16-18. Therefore, Rembrand anticipates all limitations of the claim.

Claim 33 is limited to “the method according to claim 21,” as covered by Rembrand: Rembrand discloses a microphone 2 for detecting “ambient sound.” Mixer 3 mixes the ambient sound with a noise signal generated by either noise generator 1 or 9 to form a combined signal that is fed to earphone, such that the

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“compensatory sound” generated by the earphone comprises the “ambient signal” and the “compensatory signal.” Therefore, Rembrand anticipates all limitations of the claim.

Claim 34 is limited to “the method according to claim 21,” as covered by Rembrand. The “ambient sound signal” generated by microphone 2 is amplified by amplifier 5 before being reproduced by earphone 6. Therefore, Rembrand anticipates all limitations of the claim.

Claim 36 is limited to “the method according to claim 21,” as covered by Rembrand. Rembrand makes no distinction as to what frequencies are reproduced, instead the datapath indicates by its lack of filters that all frequencies are generated, i.e. “frequencies within and outside of said otoacoustic emissions waveform.” Therefore, Rembrand anticipates all limitations of the claim.

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Claim 37 is limited to “a method for enhancing the hearing of certain sounds.” Apropos the rejection of claim 1, it was shown that Rembrand discloses producing a noise signal by way of either noise generator 1 or noise generator 9. The noise signal corresponds to the “compensatory signal” as recited. The signal provides natural amplification according to page 1, lines 17-21. In this way, the signal “enhance[es] hearing of sounds.” The “selected predetermined band” within the scope of Rembrand’s disclosure is a wideband. The noise signal and an “ambient sound signal” detected by a microphone 2 is passed through a noise gate that “appl[ies] modification triggering criteria to each of said selected predetermined bands, according to at least a respective portion of an ambient sound signal,” and when the combined signal exceeds a threshold, the noise gate “modif[ies] said ambient sound signal corresponding to each of said selected predetermined bands, according to said compensatory signal. See page 3, lines 9-18. Therefore, Rembrand anticipates all limitations of the claim.

Claim 39 is limited to “the method according to claim 37,” as covered by Rembrand. “Ambient sound” is detected by microphone 2. Therefore, Rembrand anticipates all limitations of the claim.

Claim 40 is limited to “the method according to claim 37,” as covered by Rembrand. Rembrand discloses an earphone 6 for reproducing, and thus, generating a sound based on the “modified signal” output by the noise gate 4. Therefore, Rembrand anticipates all limitations of the claim.

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Claim 42 is limited to “the method according to claim 37,” as covered by Rembrand. Apropos the rejection of claim 8, it was shown that Rembrand discloses a noise gate 4 with a single threshold. The noise gate passes combined signals above a threshold and blocks signals below a threshold, i.e. “enabling said modification when said combined energy is greater than said threshold and disabling said modification when said combined energy is lower than said threshold.” Therefore, Rembrand anticipates all limitations of the claim.

Claim 44 is limited to “the method according to claim 42,” as covered by Rembrand. Rembrand nominally discloses adapting the threshold of the noise gate 4 based on a user’s hearing loss. Therefore, Rembrand anticipates all limitations of the claim.

Claim 48 is limited to “the method according to claim 37,” as covered by Rembrand. The modification performed in the processor disclosed by Rembrand is that of “adding said respective portion to said compensatory signal corresponding with a respective one of said selected predetermined bands.” This is evidenced by the mixer 3, that inherently performs addition. Therefore, Rembrand anticipates all limitations of the claim.

Claim 49 is limited to “the method according to claim 48,” as covered by Rembrand. The process of adding noise to the ambient signal and then comparing the resulting combined signal to a chopping threshold corresponds to “inducing stochastic resonance.” Therefore, Rembrand anticipates all limitations of the claim.

Claim 52 is limited to “the method according to claim 37,” as covered by Rembrand. The amplitude of the signal passed by the noise gate is based on the amplitude of the signal input to the noise gate. The amplitude of the input signal is based on “the compensatory waveform determined according to ear otoacoustic emissions.” Otoacoustic emissions inherently correspond to “physiological status.” See page 2, lines 29-33. Therefore, Rembrand anticipates all limitations of the claim.

Claim 53 is limited to “the method according to claim 52,” as covered by Rembrand. Apropos the rejection of claim 52, it was shown that Rembrand discloses monitoring “otoacoustic emissions,” and thus, “physiological status.” Therefore, Rembrand anticipates all limitations of the claim.

Claim 56 is limited to “the method according to claim 37,” as covered by Rembrand. Apropos the rejection of claims 52 and 53, it was shown that Rembrand discloses monitoring otoacoustic emissions and using those to determine a combined signal that is passed to a noise gate that determines its output’s amplitude based on its input’s amplitude. Therefore, Rembrand anticipates all limitations of the claim.

2. **Claims 6 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Rembrand in view of the Mackie 1202VLZ Pro Mixer Owner’s Manual (available at: http://www.mackie.com/pdf/1202vlzpro_om.pdf).**

Claim 6 is limited to “the system according to claim 5,” as covered by Rembrand. MPEP section 2131.01(III) enables a rejection under 35 U.S.C. §

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102(b) with more than one reference when the secondary reference(s) sets forth inherent details of the first reference. In this case, the Owner's Manual sets forth the inherent properties of the Mackie 1202VLZ Pro Mixer disclosed by Rembrand. Rembrand discloses that the mixer 3 includes user controls while not specifying what features the controls comprise. However, Rembrand does disclose that the mixer is implemented using a Mackie 1202VLZ Pro Mixer, which includes a plurality of user controllable gain settings, i.e. "volume user interface." See page 18, bullet 28, of the Mackie 1202VLZ Pro Mixer Owner's Manual.

Therefore, Rembrand anticipates all limitations of the claim.

Claim 51 is limited to "the method according to claim 37," as covered by Rembrand. MPEP section 2131.01(III) enables a rejection under 35 U.S.C. § 102(b) with more than one reference when the secondary reference(s) sets forth inherent details of the first reference. In this case, the Owner's Manual sets forth the inherent properties of the Mackie 1202VLZ Pro Mixer disclosed by Rembrand. Rembrand discloses that the mixer 3 includes user controls while not specifying what features the controls comprise. However, Rembrand does disclose that the mixer is implemented using a Mackie 1202VLZ Pro Mixer, which includes a plurality of user controllable gain settings, i.e. "volume user interface." See page 18, bullet 28, of the Mackie 1202VLZ Pro Mixer Owner's Manual. The settings of the mixer inherently perform a "preliminary procedure of controlling the amplitude of said ambient sound signal via a volume user interface." Therefore, Rembrand anticipates all limitations of the claim.

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3. **Claims 1, 20, 21 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Kandel et al. (US Patent 6,353,671).**

Claim 1 is limited to “a system for enhancing the hearing of certain sounds.” Kandel discloses a signal processing circuit and method for increasing speech intelligibility. See Abstract. Kandel discloses a speaker 117 that corresponds to the “electro-acoustic transducer” as recited and a mixer 113 that corresponds to the “compensatory signal generator” as recited. The mixer 113 generates a “compensatory signal” based on the output from filter 120, which corresponds to a “compensatory waveform” based on “otoacoustic emissions” received by microphone 118. See column 9, lines 42-57. Therefore, Kandel anticipates all limitations of the claim.

Claim 20 is limited to “the system according to claim 1,” as covered by Kandel. Kandel discloses that the output of the filter 120 provides negative feedback. In other words, it provides a “compensatory waveform” that is “anti-phase” to a portion of an otoacoustic emission received by microphone 118. See column 9, lines 42-57. Therefore, Kandel anticipates all limitations of the claim.

Claim 21 is limited to “a method for enhancing the hearing of certain sounds.” Kandel discloses a speaker 117 and a mixer 113 that perform the steps of “producing a compensatory sound” and “producing a compensatory signal” respectively. See column 9, lines 42-57. Therefore, Kandel anticipates all limitations of the claim.

Claim 35 is limited to “the method according to claim 21,” as covered by Kandel. Kandel discloses that the output of the filter 120 provides negative

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feedback. In other words, it provides a "compensatory waveform" that is "anti-phase" to a portion of an otoacoustic emission received by microphone 118. See column 9, lines 42-57. Therefore, Kandel anticipates all limitations of the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 43, 45, 46, 47 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rembrand.**

Claim 43 is limited to "the method according to claim 42," as covered by Rembrand. Apropos the rejection of claim 9, it was shown that Rembrand teaches "wherein each of said" threshold "is different for different ones of said at least one triggered acoustic modifier." However, the claim recites the "upper level threshold" and "lower level threshold" in place of the "threshold." As Rembrand only teaches the use of one threshold, Rembrand fails to anticipate all limitations of the claim. However as will be shown below, the claimed invention is obvious in view of a well known manipulations.

In particular, the examiner takes Official Notice of the fact that hysteresis was well known at the time of the invention as an aid in performing threshold comparisons. Hysteresis requires two thresholds for performing a comparison.

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The first threshold is an “on” threshold and is higher than the second threshold. The second threshold is an “off” threshold. In operation, a signal crossing the first threshold will generate an “on” condition at the output of a comparator using hysteresis. The same signal must not only then fall below the level of the first threshold to turn off the comparator’s output, but must also fall below the second threshold before the comparator’s output turns off. This threshold separation inherently provides a degree of noise immunity so that a signal that naturally rests close to a threshold does not force the comparator’s output to oscillate between an “on” and “off” state as a function of noise that is distorting the signal.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the single threshold disclosed by Rembrand with two thresholds that form a hysteresis comparator as was known in the art for the purpose of providing improved noise immunity over the single threshold.

Claim 45 is limited to “the method according to claim 42,” as covered by Rembrand. The noise gate 4 “gates,” i.e. blocks or chops, the ambient sound signal based on its value in comparison to the threshold value of the noise gate. In this way, the noise gate 4 controls the amplitude. Apropos the rejection of claim 43, it would have been obvious to use two thresholds, such that the two thresholds of the noise gate determine whether the amplitude of the “ambient signal” is chopped. Therefore, Rembrand makes obvious all limitations of the claim.

Claim 46 is limited to “the method according to claim 42,” as covered by Rembrand. The noise gate chops the “compensatory signal” generated by one of noise generators 1 and 9 after the signal is mixed with an ambient signal detected by microphone 2. Apropos the rejection of claim 43, it would have been obvious to use two thresholds, such that the two thresholds of the noise gate determine whether the amplitude of the “compensatory signal” is chopped. Therefore, Rembrand makes obvious all limitations of the claim.

Claim 47 is limited to “the method according to claim 42,” as covered by Rembrand. Rembrand discloses that the thresholds should be set based on the hearing loss of the user, i.e. “speech recognition threshold of an ear.” Apropos the rejection of claim 43, it would have been obvious to use two thresholds, such that the two thresholds of the noise gate are determined based on the “speech recognition threshold of an ear. Therefore, Rembrand makes obvious all limitations of the claim.

Claim 50 is limited to “the method according to claim 37,” as covered by Rembrand. Although not explicitly suggested in Rembrand, it is obvious to one of ordinary skill in the art that in using the hearing aid disclosed by Rembrand, a “machine generated signal,” such as one generated by a TV, car, gun, etc...will be detected by the microphone 2 of the hearing aid. Therefore, Rembrand makes obvious all limitations of the claim.

5. **Claims 19, 54 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rembrand in view of Bauer (US Patent 3,475,566).**

Claim 19 is limited to “the system according to claim 1,” as covered by Rembrand. Rembrand simply does not mention a “mode selection user interface.” However, as will be shown below this difference results from an obvious modification.

In particular, on/off switches are well known in the hearing aid art. As easily recognized, a hearing aid user can switch between an amplifying mode (on) and a power saving mode (off). Bauer teaches a hearing aid with a particular on/off switch as seen in figures 2 and 6.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide multiple input types and means to switch between the input types as taught by Bauer for the purpose of allowing a hearing aid to amplify sounds and subsequently reduce power consumption of a battery when amplification is not necessary.

Claim 54 is limited to “the method according to claim 37,” as covered by Rembrand. Apropos the rejection of claim 19, it would have been obvious to include an on/off switch within a hearing aid and means to switch between an amplification mode and a power saving mode. Therefore, Rembrand in view of Bauer makes obvious all limitations of the claim.

Claim 55 is limited to “the method according to claim 54,” as covered by Rembrand. When in an “off” state, the hearing aid of Rembrand as modified by Bauer will not amplify input signals, and thus, effects the amplitude of a sound signal and compensatory signal.

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6. **Claims 7-12, 38 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rembrand in view of Stockham, Jr. et al. (US Patent 5,500,902) and further in view of Anderson (US Patent 4,396,806).**

Claim 7 is limited to “the system according to claim 1,” as covered by Rembrand. Apropos the rejection of claim 5, Rembrand clearly discloses an “ambient acousto-electric transducer.” It is noted that while Rembrand discloses an amplifier 5 and 10, which forms the heart of any hearing aid, Rembrand discloses that the amplifier is an “Altec Lansing Multimedia” on page 3, line 27, but fails to disclose how one of ordinary skill in the art is to construct an operational hearing with said amplifier. It is further noted that although Rembrand teaches a noise gate 4, it is not arranged with a bandpass filter. Therefore, Rembrand fails to anticipate all limitations of the claim and as arranged, particularly the “band-pass filter” and the “triggered acoustic modifier.” However, it will be shown below that these elements are well known in the art.

Particularly, it is known in the prior art—as evidenced by Stockham, Jr. et al.—that hearing aids should be designed for use in noisy environments and should be designed to compensate for distinct hearing losses in distinct frequency bands. See column 1, lines 13-22, and column 2, lines 40-63. Rembrand, discloses the noise gate threshold as a function of the user’s hearing loss (see page 3, lines 15 and 16), but contrary to teachings of robust hearing aid design uses a single threshold for all frequencies. In view of this disclosure, unless all of the critical bands of a user of Rembrand’s device are effected in the same manner (i.e. same amount of hearing loss), providing a noise gate

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threshold for each critical band, where each threshold is based on the hearing loss in a particular critical band, will provide much better hearing aid. This structure is taught in the prior art. In particular, a plurality of bandpass filters separate an input signal into distinct paths that are independently compressed, or in the case of a modified version of Rembrand, gated. See, for example, figure 3 of Anderson, where units 82 correspond to the "at least one band-pass filter" as recited and units 84 correspond to the noise gates, and thus, the "at least one triggered acoustic modifier" as recited.

It would have been obvious to one of ordinary skill in the art at the time of the invention to separate the noise gating function disclosed by Rembrand into a plurality of noise gating functions performed on distinct frequency groups defined by a plurality of bandpass filters as taught by Stockham in view of Anderson for the purpose of providing increased hearing, fidelity and intelligibility. See column 2, lines 40-63, of Stockham.

Claim 8 is limited to "the system according to claim 7," as covered by Rembrand in view of Stockham and further in view of Anderson. Rembrand discloses a mixer 3 that generates a "combined signal" comprising a microphone signal received from microphone 2 and a noise signal received from one of noise generators 1 and 9. Rembrand further discloses that this signal is the signal that is input to noise gate 4, which was modified apropos the rejection of claim 7 to include a plurality of input bandpass filters and a plurality of noise gates that comprise independently set gate thresholds. Rembrand discloses the use of a single threshold within the noise gate 4, the single threshold corresponds to the

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"threshold" as recited. See page 3, lines 9-18. The "combined signal" comprising the signals from units 2 and either 1 or 9 exceeds the "threshold," the noise gate passes the combined signal. Therefore, Rembrand in view of Anderson makes obvious all limitations of the claim.

Claim 9 is limited to "the system according to claim 8," as covered by Rembrand in view of Stockham and further in view of Anderson. Apropos the rejection of claim 7, it was shown that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Rembrand so that the single noise gate disclosed therein is modified to operate on at least one frequency band by adding a bandpass filter to its input. In this way, the hearing threshold for a particular critical band is compensated based on its associated hearing loss without effecting other critical bands that do not share the same hearing loss. In other words, each critical band of an ear is assigned a particular noise gate threshold based on its own hearing loss. This corresponds to "wherein each of said" threshold "is different for different ones of said at least one triggered acoustic modifier." However, the claim recites the "upper level threshold" and "lower level threshold" in place of the "threshold." As Rembrand only teaches the use of one threshold, the combination of references noted above fails to make obvious all limitations of the claim. However as will be shown below, the claimed invention is obvious in view of a well known manipulations to the above noted combination.

In particular, the examiner takes Official Notice of the fact that hysteresis was well known at the time of the invention as an aid in performing threshold

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comparisons. Hysteresis requires two thresholds for performing a comparison. The first threshold is an "on" threshold and is higher than the second threshold. The second threshold is an "off" threshold. In operation, a signal crossing the first threshold will generate an "on" condition at the output of a comparator using hysteresis. The same signal must not only then fall below the level of the first threshold to turn off the comparator's output, but must also fall below the second threshold before the comparator's output turns off. This threshold separation inherently provides a degree of noise immunity so that a signal that naturally rests close to a threshold does not force the comparator's output to oscillate between an "on" and "off" state as a function of noise that is distorting the signal.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the single threshold disclosed by Rembrand with two thresholds that form a hysteresis comparator as was known in the art for the purpose of providing improved noise immunity over the single threshold.

Claim 10 is limited to "the system according to claim 8," as covered by Rembrand in view of Stockham and further in view of Anderson. The state of the ambient sound signal and compensatory signal do not limit the structure of the system according to claim 8. Therefore, claim 10 does not further limit claim 8 and Rembrand in view of Stockham and further in view of Anderson makes obvious all limitations of the claim.

Claim 11 is limited to "the system according to claim 7," as covered by Rembrand in view of Stockham and further in view of Anderson. Stockham teaches that a hearing aid should be designed to process each "critical band"

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separately, such that each bandpass filter of Anderson needs to have a pass band equal to a "critical band." See column 2, lines 40-63. Therefore, Rembrand in view of Stockham and further in view of Anderson makes obvious all limitations of the claim.

Claim 12 is limited to "the system according to claim 7," as covered by Rembrand in view of Stockham and further in view of Anderson. Apropos the rejection of claim 3 it was shown that Rembrand discloses the "waveform storage unit" and "processor" as recited. When the laptop 1 of Rembrand generates a noise signal as disclosed, it forwards this signal to the modified noise gate 4, which means the processor communicates with the noise gate 4 and its associated bandpass filter. Communication requires coupling, meaning the "processor" or Rembrand is coupled with the "band-pass filter" and "triggered acoustic modifier" as recited. Rembrand, however, does not disclose that the processor is arranged such that it "determines a value for said modification triggering criteria and provides a modification triggering signal respective of said at least one determined value to said at least one triggered acoustic modifier." However as will be shown below, programming a hearing aid's components with a computer is obvious.

In particular, Rembrand discloses a user settable threshold. See page 3, lines 9-15-17. As Rembrand fails to teach a method for updating this threshold, one of ordinary skill in the art would be inherently motivated to provide a threshold adjusting means. Anderson teaches such a means in figures 2 and 3 therein. A coefficient selector subsystem 34 is provided to interface between an

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external computer 62 and the compression means therein, which corresponds to the noise gate of Rembrand. The laptop 1 of Rembrand is perfectly suited to provide a serial data stream to the selector 34 taught by Anderson.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a coefficient selector 34 that receives programming from an external computer, such as laptop 1 of Rembrand, for the purpose of providing reprogrammable hearing aid parameters to a hearing aid device and because Rembrand fails to disclose how to set a noise gate's threshold parameters.

Claim 38 is limited to "the method according to claim 37," as covered by Rembrand. Because Rembrand operates on a wideband signal, there is necessarily a lack of disclosure directed towards "a preliminary procedure of classifying said ambient sound according to said predetermined bands." However, apropos the rejection of claim 7, it would have been obvious to the mixed ambient sound and compensatory signal into distinct frequency bands for critical band based processing. Therefore, Rembrand in view of Stockham and further in view of Anderson makes obvious all limitations of the claim.

Claim 41 is limited to "the method according to claim 37," as covered by Rembrand. Apropos the rejection of claims 7 and 38, it would have been obvious to perform critical band processing. Therefore, Rembrand in view of Stockham and further in view of Anderson makes obvious all limitations of the claim.

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7. **Claims 14 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rembrand in view of Stockham in view of Anderson and further in view of Sandlin (Textbook of Hearing Aid Amplification, © 2000).**

Claim 14 is limited to "the system according to claim 7," as covered by Rembrand in view of Stockham and further in view of Anderson. The datapath described by the combination of Rembrand and Anderson includes an analog output from noise gate 4. Therefore, the combination necessarily fails to make obvious a digital to analog converter between said electro-acoustic transducer and said at least one triggered acoustic modifier. However as will be shown below, making an analog hearing aid a digital hearing aid is obvious.

In particular, Sandlin teaches on pages 295 and 296 that digital hearing aids benefit from miniaturization, low power consumption, low internal noise, reproducibility, stability, programmability and signal processing complexity. An exemplary digital datapath is illustrated on page 287, figure 8-2. The datapath includes an A/D and D/A and replaces the analog signal processor with a digital signal processor.

It would have been obvious to modify the analog datapath of Rembrand and Stockham from an analog datapath into a digital datapath as taught by Sandlin for the purpose of realizing the above mentioned advantages.

Claim 57 is limited to "the method according to claim 37," as covered by Rembrand. The datapath described by Rembrand includes an analog output from noise gate 4. Therefore, Rembrand necessarily fails to make obvious a digital to analog converter between said electro-acoustic transducer and said at

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least one triggered acoustic modifier. However as will be shown below, making an analog hearing aid a digital hearing aid is obvious.

In particular, Sandlin teaches on pages 295 and 296 that digital hearing aids benefit from miniaturization, low power consumption, low internal noise, reproducibility, stability, programmability and signal processing complexity. An exemplary digital datapath is illustrated on page 287, figure 8-2. The datapath includes an A/D and D/A and replaces the analog signal processor with a digital signal processor.

It would have been obvious to modify the analog datapath of Rembrand from an analog datapath into a digital datapath as taught by Sandlin for the purpose of realizing the above mentioned advantages.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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